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Low cost Shared Storage for Data Protection and long-term Preservation of Big Data
• Storage is a critical piece and one of biggest expenses for Big Data infrastructure, increasing at a **CAGR of 53% between 2011 and 2016***
• from $380 million in 2011 to $6 billion in 2016.

*Ashish Nadkarni, Research Director, Storage Systems

[Big Data to Drive Big Demand for Storage – IDC](StorageNewsletter.com on Wed, April 17th, 2013)
• Performance was cited as the primary driver for selecting storage architecture among 68.6% of respondents. Another 59.5% indicated cost as a primary driver (multiple responses were allowed).

• Businesses will continue to struggle with what data to analyze, how to store data before and after it is analyzed.
IDC Estimates that unstructured data now accounts for more than 90% of our digital universe with “1.8 trillion gigabytes in 5000 quadrillion ‘files’ – and more than doubling every two years.” -- Chaos”, IDC IVIEW, June 2011.
By 2012, 80% of all storage capacity sold will be for file-based data.
### Unstructured Data Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>Company IP, Data is Product</td>
</tr>
<tr>
<td>Image</td>
<td>Life: Forever</td>
</tr>
<tr>
<td>Sound</td>
<td>eDiscovery, Historical reference</td>
</tr>
<tr>
<td>Text</td>
<td>Life: Limited</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td></td>
</tr>
<tr>
<td>Database</td>
<td></td>
</tr>
</tbody>
</table>
Current (disk) Solutions

- Expensive
- Fails
- Doesn’t Scale
- Short life
- Power

**What do customer’s want:**
- Keep all their data
- Online and accessible
- Keep it forever

<table>
<thead>
<tr>
<th>Petabytes</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget ($/Petabyte)</td>
<td>$2,000</td>
<td>$1,800</td>
<td>$1,600</td>
<td>$1,400</td>
</tr>
<tr>
<td></td>
<td>$1,600</td>
<td>$1,400</td>
<td>$1,200</td>
<td>$1,000</td>
</tr>
<tr>
<td></td>
<td>$1,200</td>
<td>$1,000</td>
<td>$800</td>
<td>$600</td>
</tr>
<tr>
<td></td>
<td>$800</td>
<td>$600</td>
<td>$400</td>
<td>$200</td>
</tr>
</tbody>
</table>
Go Forward Value of Storage

Archive $/Petabyte

Disk is no longer doubling

Tape is doubling in capacity

Step function increase coming within next 4 to 6 years

2010 Demonstrated 50 TB on single cartridge

2010 Demonstrated 35 TB on single cartridge
STRONGBOX

LTFS
Linear Tape File System

- Self describing file system
- Faster access to data
- Simple drag and drop
- Compatibility across environment
- Increased data mobility
- A single storage media standard
- Non-proprietary

The major (and I would almost classify it as a breakthrough) advance that LTFS provides is that LTFS changes tape from application dependent to application independent.

   Jerome Wendt DCIG
• **Manage complexity** to get better access of your data when you want it at a cost effective price

• Meet application **work-flow** requirements for performance and productivity

• Easy of use of advance features that ensure **online, secure, resilient data protection**

• **Future Proof and Vendor Neutral**

• **Works within our existing environments**
**Simple**: “looks like a normal drive”  
-- Scott Lee, Cyark

**Accessible**: “just click and open…”  
-- Clive Barker, MLB

**Valuable**: “1/10th the cost of our disk system”  
-- Frank Huiskes, CTO Cap Gemini
Solving data archiving for today, tomorrow and the future

“StrongBox is an excellent tool within my environment, providing flexibility that makes it functional in multiple use-cases for MLB Network.”

—Tab Butler Director of Media Management
Major League Baseball Network
• Over 43,200 images to date
• Need for expanding archive
• Data sync from primary storage to StrongBox
• User access via StrongBox

- 36 active missions
- Ever growing digital repository
- Need for ongoing scientific research

Mars Curiosity Rover Mission
Memory Based Storage

High Performance Disk

Cost of Scale

• Add more disk
• Orders of magnitude reliability
• Massive scalability
• Infinite life span
• Low power

Infinite life span

HSM or Backup Server

Simplified Workflow

Tape Library

Simplified Workflow

Add more backup

Workflow
No Dependency On:

- Operating system
- Applications
- Specialized agents
- Proprietary software layer

No change to:

- File formats, attributes
- File privileges, rights
- Applications
Data Integrity
- Tamper checking
- LTFS check

Data Reliability
- HASH code per file
- Drive/Tape error correlation
- Self healing
- No Delete

Data Redundancy
- Multi-Copy (different media)
- Secure over wire replication
- Media export
Data Tiering

- Retain files on disk cache (last access timer)
- Small file retention (by size)
- Recent file access caching

File Access

- Pre-Fetch (GUI or API)
- Sequenced reads
COST OF 1 PETABYTE | 2 COPIES | 10 YEARS
*A New Approach to Lowering the Cost of Storing File Archive Information, Brad Johns Consulting, 2012
Intelligent Tiering Reduces Storage Costs

Tiers of Storage

Single Tier
- Average ~$15,000/TB

Disk Multi-Tiered
- Average ~$8,000/TB
- Flash Storage $40 - $54/GB
- Performance Disk $7 - $22/GB
- Capacity Disk $1 - $6/GB
- Tape $0.25 - $1/GB

Mixed Multi-Tiered
- Average ~$4,000/TB
- 60% Flash Storage
- 32% Performance Disk
- 6% Capacity Disk
- 6% Tape

Overall, the mixed multi-tiered approach offers the lowest average cost per TB.
StrongBox 92%

Performance
Disk/SSD 8%

TOTAL: $7,076,458
\[
\text{Disk/SSD: } \frac{\text{7,076,458}}{\text{1,124,541}} \approx 0.63
\]

\[
\text{StrongBox: } \frac{\text{7,076,458}}{\text{1,124,541}} \approx 6.3\%
\]

84% REDUCTION IN COST OF STORAGE

TOTAL: $1,124,541

vs.

DISK TOTAL: $7,076,458
THANK YOU!

For More Information visit our Web site at:
www.crossroads.com